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Specification
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DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR WATER-SUCTION HOSE (SMOOTH BORE)

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 50a

[Revised September 16, 1925]

This specification was officially promulgated by the Federal Specifications Board on October 6, 1922, for the use of the departments and independent establishments of the Government in the purchase of water-suction hose (smooth bore).

[The latest date on which the technical requirements of this revision shall become mandatory for all departments and independent establishments of the Government is December 16, 1925. They may be put into effect, however, at any earlier date after promulgation]

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I. GRADE

Hose shall be of a single grade.

II. MATERIAL AND WORKMANSHIP

Hose shall be free from defects in material and workmanship.

III. GENERAL REQUIREMENTS

1. Construction.—Hose shall consist of (*a*) an inner rubber tube, (*b*) a layer of cotton duck, (*c*) a helix of wire with rubber filling between the coils, (*d*) a second layer of rubber, (*e*) layers of cotton duck, (*f*) an outer rubber cover. Both ends of hose shall be capped with the same rubber compound that is used in the tube. Length of hose shall be as specified in the proposal.

2. Tube and Cover.—Tube and cover shall be smooth, free from pitting, and of uniform thickness.

3. Cotton Duck.—Cotton duck shall be well, evenly, and firmly woven, as free from unsightly defects, dirt, knots, lumps, and irregularities of twist as is consistent with the best manufacturing practice. The layers shall be applied on a bias of 45°, with edges lapped at least ½ inch (not sewed), and shall be well impregnated with a rubber compound.

4. Wire Reinforcement.—The helix shall be of heavily galvanized round spring steel wire. Helix shall end at such a distance from the end of hose that it will extend over the tailpiece of the coupling (length of which shall be specified) about 1 inch when the hose is trimmed and the coupling attached. The end shall be properly secured, and the space thus left for attachment of coupling shall be filled with well-frictioned cotton duck layers of the same material as is used in the body of the hose.

5. Rubber Filling Strips.—The space between adjacent wires shall be filled with strips of the same quality of rubber compound as is used in the tube. The strips shall be of such thickness that the outside of hose will not show appreciable corrugations.

Physical test requirements

Size—inches	1½	2	2½	3	4	6	8	10	12
Internal diameter—do	1½	2	2½	3	4	6	8	10	12
Outside diameter:									
Soft ends for couplings—do	2½	3	3 3/16	4 3/32	5¼	7½	9 5/8	11 7/8	14 1/16
Soft ends for nipples—do					5 5/8	8	10 3/16	12 9/16	14 11/16
Tolerances (plus or minus):									
Outside diameter (soft ends)—inches	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Inside diameter—do	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32
Thickness:									
Tube, minimum—do	1/16	1/16	1/16	1/16	1/16	3/32	3/32	3/32	3/32
Cover, minimum—do	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Layer, minimum—do	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Filler, minimum—do	1/8	1/8	5/32	5/32	3/16	1/4	9/32	5/16	3/8
Washers, minimum—do	1/8	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Size of wire, minimum—do	.120	.120	.148	.148	.177	.244	.283	.362	.362
Spacing, maximum—do	½	½	5/8	5/8	5/8	5/8	5/8	5/8	¼
Plies of duck,[1] minimum	4	4	4	4	5	6	7	8	10
Weight of duck, minimum—ounces per square yard	14.4	14.4	14.4	18.0	18.0	18.0	18.0	18.0	18.0
Hydrostatic test pressure,[2] minimum—pounds per square inch	100	100	100	100	100	50	25	25	25
Friction between plies, and between plies and rubber parts,[3] minimum—pounds	15	15	15	15	15	15	15	15	15
Tensile strength,[4] tube and layer, minimum—pounds per square inch	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Cover, minimum—do	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Ultimation elongation, tube, layer, and cover, minimum—inches	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11
Set, tube, layer, and cover, stretch 10 minutes—inches	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10
Set after 10 minutes rest, maximum—per cent	25	25	25	25	25	25	25	25	25

[1] The hose in all sizes is to be made with 1 ply of duck over the tube.
[2] Hose complete with couplings (or nipples) shall withstand the pressure indicated without leakage or any indication of weakness.
[3] The rate of separation shall be not greater than 1 inch per minute under the specified load.
[4] The tensile strength of tube, layer, and cover, after being subjected to an accelerated aging test of 96 hours in dry air at 158 ± 2° F., shall show a decrease from the tensile strength determined before heating of not over 40 per cent.

6. Couplings.—Each length of hose up to and including 4-inch (when 4-inch is so specified) shall be fitted with couplings and clamps as specified. The female coupling shall be fitted with a rubber washer cut from a tube of the same composition and cure as the hose tube.

7. Nipples.—Each length of hose, 4-inch (when so specified) and larger, shall be fitted with nipples securely vulcanized into the hose and firmly fastened with clamps as specified. The nipples shall be cut from standard pipe and threaded at one end. Threads shall be adequately protected for shipment.

8. Flanges.—Each nipple shall be fitted with a standard flange for 125 pounds working pressure, unless otherwise specified. Nipples and flanges shall both be of ferrous metal.

9. Strainers.—Suction strainers shall be furnished only when specifically called for in the proposal.

IV. DETAIL REQUIREMENTS

1. Physical Requirements.—Hose shall meet all requirements stated in the table.

2. Chemical Requirements.—The tube, layer, filler, cover, and washers shall contain not less than 75 per cent, by volume, of the

best quality new wild or plantation rubber. The compounds shall be free from all substances which might injuriously affect the quality.

V. INSPECTION AND SAMPLING

The manufacturer shall notify the purchaser sufficiently in advance of the completion of the hose to permit of arrangements for inspection. Inspection and tests shall be made at the place of manufacture unless otherwise specified, manufacturer providing a place for conducting tests; also necessary help, equipment, etc.

With each lot of 50 lengths or less the contractor shall furnish a section of hose 12 inches long, which he shall guarantee to be made of the same materials and to be of the same construction and cure as the hose delivered, except that the helix of wire shall be omitted. He shall also furnish with each order 1 foot of unfrictioned duck the full width of the bolt.

The inspector shall, after tests, mark the remainder of samples with manufacturer's name, order, requisition, and item numbers and forward them to the testing laboratory. Any lot represented by a sample which fails in one or more tests may be retested at the expense of the contractor. For this purpose two additional samples shall be selected. Failure of either in any respect shall be cause for rejection.

VI. PACKING AND MARKING

Packing shall be as specified in the proposal. Brands shall contain the manufacturer's name and trade-mark. Hose 25 feet or more in length shall have brands inlaid in the rubber cover at two places on each length, approximately 4 feet from the ends, letters to be at least ¼ inch high. Hose less than 25 feet in length shall have one inlaid brand approximately in the center.

VII. ADDITIONAL INFORMATION

No details specified.

VIII. GENERAL SPECIFICATIONS

All tests and analyses shall be made in accordance with the methods described in United States Government General Specifications for Rubber Goods, Federal Specifications Board Specification No. 59, in effect on date of proposal.

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